

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

Figure 1

GstA1 promoter

GACGCCGAAGTGGAGCCGACAGCCCCAGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGGATCGGCGAGGTGAC  
TGGATGACGAGCAGCACCTGGTCTGGCGGGTGTGGGCGAGTAGAACCAGGGGCGATGGCGACGCGCTGACCTTCTCCCC  
TCACCGGCGATCTGCTCCTTCTGGGTGGGGGTGCGCCGGCTGACGTTCTGTTGCGGGGTGGGGGTGCGCCGGCTGGCGTTCT  
GCTGCGGGGTGGGAGTCGCGACCGGCGTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTG  
GCGAAGAGATCCGAGTCCTGGGGAGATCAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGG  
GCGTGGCGTGATCAACGAGGTGCTAGGCTGCTAGCTAGGGAAGTGGATCCTGGAACGTGGAGGAGGCAAGTCCGGTATGC  
TAAGTACTTTAACTTTCCTTCTCACATCCACCTGATTCAGATTATTTTGATCTAAATTAACCTTGCAAAAAATATATGTG  
TGATATCCATCTACTATAATTGCTTACAATCAAAATTATATGTGATTTTTTTTAGTTTAGAAGATTATATGCACAGTAA  
ATCTGAATGTTCTTACATGCATGATTTAGTTTAACTTTAAAGAGTTATACTAACTAGTCTTGATAAAGAGATCTTTTGG  
AGCAACACCAAACCTCGTGAGGTGTTTTGCGCTACGGAAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAGTTGTA  
GGATAAACGTAAAACCTTCTCGATGTATCTTTTATACAACATTGTAGTTTAGTTATATATGGAGAGAGTGATTTAACACT  
TTGTGTTTAAAGAGTAGAATAAGTTATTCCACACTCTAGCCAAACGAACATTTTGGCAAATATCTCGCTAGCTGGTGAGAG  
CCAGAGCCGTGGAAAGTCTGTCTTGCTATTAAGGCACAAGCATCAAACAGGAACATTTAGAGCCATGGAAAAGTGATGTG  
TCGCTACCAATGGGCCAACTGCTAGCGATGTAATAATAGCATCCAAGTTGATTTTTTATAGAACATGCAAGGCGTTGGC  
AAGTGGGAAAATGATTGATCGCTGGCAAGCTTAACTCTCGGAAGTTATAGCATTCAACTGAATCAGAACAAAGATTAAAA  
AAAAATACATTTCCATCGATAGTGAAAAATTATTCAATTGAGTGACAACGAAAATCATATTGGAATGTACATTTACTTGT  
TGATTTTAAATTAGAGGCATTTTTCTACCTTTTTTAGTTAATAAGATATGCATATACCCACCCTTAGTGTTTTCGAGACA  
ACGAGAGGGCACATTGCTTTTGGTGCTACCATCTCTCTCAAGCCTCAAATAAGTTGTGCGGACACGATTATCTTCCGCG  
TTGGAATATCGTGGCCTGGTAGAGCTAGCGAAAAATCTTCCATGTTGGAATATGTCGGCAGCCGGATAGCCGCCATGCAT  
GTAAAGTCTCTTTTACCTTTACACTTGCTCAAGTGACACTGTATGTCGCCTACCACTTGCTAAATCAATGGGCCAACTGC  
TAGCGACGTAATAGTAGCAAGTTGATTTACAGTGTTTTGCTACAGTTCTCTGACTTTGTTTCTTCAATTTAGACTAGCTG  
ACTACTGTCGCTTACCTGCCTTCCCTTCTCCACGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAG  
GGCGCGATCGATGTGGAGTAATTTGAATTTCAAATCTATCTATCTGGGGTATATTGGTCCTTACCGATGTTTGGGGGGC  
TGTCGGAAATTGGTTCCGCGATCTACAAAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTT  
CTAACTAGTACTTACTTCCCTTCGCACCACAATATGGAATAGAGGGAGTATCGATAAACTAACAAAGATGATTACTTACCC  
GGTTTAAATGATTCAAGAGCTCATTTAATTTGGCACTCATCATTTTATATATCTTTTTTGGTAGAAATGAAATAAGCAG  
ATCTAGACACTAGCTAAAAAGTCGATGTAGCCTTGTTATTTCTTGGGCCACGCGGGCCGGGTGTGGTGCTCCCTGCTCT  
GTGTATAAATGGAGATCAACATCCAAGGCCTCCTCCCA

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Figure 2

WIR1A intron

GTCAGTCGTCCGACGGTGTCCGTTCAATTCCTCCCCATTTTGTAAATTGATTAACCTGTTATAGATGCTGACCTCGACCTGCT  
GAATAACGTCCGTCCATGGTTTCCCGTCCAGGCACC

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Figure 3

GstA1 promoter with WIR1a exon/intron:

GACGCCGAAGTGGAGCCGACAGCCCCAGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGGATCGGCGAGGTGAC  
TGGATGACGAGCAGCACCTGGTCTGGCGGGTGTGGGCGAGTAGAACCAGGGGCGATGGCGACGCGCTGACCTTCTCCCC  
TCACCGGCGATCTGCTCCTTCTGGGTGGGGTTCGCCGGCTGACGTTCTGTTGCGGGGTGGGGTTCGCCGGCTGGCGTTCT  
GCTGCGGGGTGGGAGTCGCCGACCGCGTGCTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTG  
GCCAAGAGATCCGAGTCCTGGGGAGATCAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGG  
GCGTGGCGTGATCAACGAGGTGCTAGGCTGCTAGCTAGGGAACCTGGATCCTGGAACGTGGAGGAGGCAAGTCCGGTATGC  
TAAGTACTTTAACTTTCCTTCTTCACATCCACCTGATTGAGATTATTTTATGATCTAAATTAACCTGCAAAAAATATATGTG  
TGATATCCATCTACTATAATTGCTTACAATCAAAATTATATGTGATTTTTTTTAGTTTAGAAGATTATATGCACAGTAA  
ATCTGAATGTTCTTCACATGCATGATTTAGTTTAACTTTAAAGAGTTATACTAACTAGTCTTGATAAAGAGATCTTTTGG  
AGCAACACCAAACCTCGTGAGGTGTTTTGCCTACGGAAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAGTTGTA  
GGATAAACGTAAACCTTCTCGATGTATCTTTTATACAACATTGTAGTTTAGTTATATATGGAGAGAGTGATTTAACACT  
TTGTGTTTAAAGAGTAGAATAAGTTATTCCACACTCTAGCCAAACGAACATTTTGGCAAATATCTCGCTAGCTGGTGAGAG  
CCAGAGCCGTGGAAAGTCTGTCTTGCTATTAAGGCACAAGCATCAAACAGGAACATTTAGAGCCATGGAAAAGTGATGTG  
TCGCTTACCAATGGGCCAACTGCTAGCGATGTAATAATAGCATCCAAGTTGATTTTTTATAGAACATGCAAGGCGTTGGC  
AAGTGGGAAAATGATTGATCGCTGGCAAGCTTAACTCTCGGAACCTATAGCATTCAACTGAATCAGAACAAAGATTAAAA  
AAAAATACATTTCCATCGATAGTGAAAAATTATTCAATTGAGTGACAACGAAATCATATTGGAATGTACATTTACTTGT  
TGATTTTAAATTAGAGGCATTTTTCTACCTTTTTTAGTTAATAAGATATGCATATACCCACCCTTAGTGTTTTTCGAGACA  
ACGAGAGGGCACATTGCTTTTGGTGCTACCATCTCTCTCAAGCCTCAAATAAGTTGTGCGGACACGATTATCTTCCCGCG  
TTGGAATATCGTGGCCTGGTAGAGCTAGCGAAAAATCTTCCATGTTGGAATATGTCGGCAGCCGGATAGCCGCCATGCAT  
GTAAAGTCTCTTTTACCTTTACACTTGCTCAAGTGACACTGTATGTCGCCTACCCTTGCTAAATCAATGGGCCAACTGC  
TAGCGACGTAATAGTAGCAAGTTGATTTACAGTGTTTTGCTACAGTTCTCTGACTTTGTTTCTTCATTTTAGACTAGCTG  
ACTACTGTCGCTTACCTGCCTTCCCTTCTCCACGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAG  
GGCGCGATCGATGTGGAGTAATTTGAATTTCAAATCTATCTATCTGGGGTATATTGGTCCTTCACCGATGTTTGGGGGGC  
TGTCGGAAATTGGTTCCGCGATCTACAAAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTT  
CTAACTAGTACTTACTTCCCTTCGCACCACAATATGGAATAGAGGGAGTATCGATAAACTAACAAAGATGATTACTTACCC  
GGTTTAAATGATTCAAGAGCTCATTTAATTTGGCACTCATCATTTATATATCTTTTTTGGTAGAAATGAAATAAAGCAG  
ATCTAGACACTAGCTAAAAAGTCGATGTAGCCTTGTTATTTCTTGGGCCACGCGGGCCGGGTGTGGTGCTCCCTGCTCT  
GTGTATAAATGGAGATCAACATCCAAGGCCTCCTCCACACACACACGCTACAGAGCAGAGCAGAGTCTTGCTCCAGTAT  
CTGCCCTCTCCTGCCTGCCTGTAGAGCATCCATCACGTGAAGTTCACGGACAACTACGTACACAGGCAGCTAGCTCTCG  
AAACCTCGCTCGAAACGCACCTGCAGATCGCTCTCTTCGTGTCGTGCGCGGATCATCATCAACAGCTCCGTCTGCCTT  
GGAGCCACGGCCGTCCACGACGCCGCCCTCAGGTCAGTCGTGCGACGGTGTCCGTTTCAATTCCTCCCCATTTTTGTAA  
TTGATTAACTTGTATACATGCTGACCTCGACCTGCTGAATAACGTCCGTCCATGGTTTCCCGTCCAGGCACC

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Figure 4

TaPERO cDNA:

ACCACCACACCACTCCACCAGTAAGAAGTGCAGCAGGTAGCTAGTAAGCCGGCGTAGCTTTGCTCTTGCAGCTAGCTAGC  
TAACCATGGCCGCCTCTGCCTCTTGCCCTTTCTCTTGTTGGTGCTCGTGGCTCTGGCCACGGCGGCGTCGGCGCAGCTGTCA  
CCGACCTTCTACGACACGTCCTGCCCCAGGGCCCTGGCCATCATCAAGAGTGGCGTCATGGCCGCCGTGAGCAGCGACCC  
TCGGATGGGCGCGTCGCTGCTCCGGCTGCACTTCCACGACTGCTTCGTCCAAGGCTGCGACGCGTCTGTTTTGCTGTCTG  
GCATGGAACAAAATGCTATCCCGAACGCGGGGTGCTGAGGGGCTTCGGCGTCATCGACAGCATCAAGACGCAGATCGAG  
GCCATCTGCAATCAGACCGTCTCCTGCGCCGACATCCTCACCCTCGCCGCCGTGACTCCGTTGTAGCCCTCGGAGGGCC  
GTCATGGACAGTCCCTCTGGGGAGAAGAGATTCCACAGATGCAAACGAGGCGGGCGGCAAACAGCGACCTGCCAGGCTTTA  
CATCTAGCCGGTCAGATCTTGAGCTGGCATTGAGAAACAAGGGCTCCTTACGATCGACATGGTGGCCCTCTCGGGCGCG  
CACACCATCGGCCAGGCGCAGTGTGGGACCTTTAAGGACAGGATCTACAATGAGACTAACATCGACACGGCCTTCGCCAC  
ATCTCTCGGGCCAACTGCCCCAGGTCAAACGGCGACGGGAGCCTGGCGAACCTGGACACGACGACGGCCAACACGTTTCG  
ATAACGCCTACTACACCAACCTCATGTACAGAAGGGGCTCCTGCACTCGGACCAGGTGCTGTTCAACAACGACACCACC  
GACAACACTGTCCGGAACCTTTGCGTCGAACCCAGCGGCGTTCAGCAGCGCCTTCACGACCGCCATGATCAAGATGGGCAA  
CATCGCGCCGAAGACAGGCACGCAGGGGCAGATCAGGCTCAGCTGCTCCAGGGTGAACCTCGTGATTGATAGACGAGTTAC  
TGCATACTAGCCAGCACGACACGTACGTGAATGAATAAGGCCACAGAACCAGTGGCCAATATAAATACCAGCTCTTGAAA  
CCGTGTATTTTATGTACGAGTAGCAGCAAATCATGCATGCATCTACACATATATATGTAACGATCGAATTCCCACTTTCT  
CATGCAAAGGCATGGAGAATTACTATCAATCTTAGTTATACGTGTA

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Figure 5a:

characteristics of pPS41:

Total length:	7011 bp
vector Backbone: pBluescript SK+,	entire construct between XhoI and SacI restriction sites
GstA1 promoter	694-2891
Transcription start:	2892
GstA1 5' UTR	2892-2988
WIR1 5' UTR (part)	2989-3034
WIR1 part of 5' CDS + Intron	3035-3246
TAPERO cDNA	3264-4509
ATG TAPERO	3348
Stop codon:	4284
Poly(A)	4510-4514
CamV 35S Terminator:	4576-4776

CTAAATTGTAAGCGTTAATATTTTGTAAATTCGCGTTAAATTTTGTAAATCAGCTCATTTTTTAACCAATAGGCCG  
AAATCGGCAAAATCCCTTATAAATCAAAGAATAGACCGAGATAGGGTTGAGTGTGTTCCAGTTTGAACAAGAGTCCA  
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACC  
CTAATCAAGTTTTTTGGGGTTCGAGGTGCCGTAAAGCACTAAATCGGAACCTAAAGGGAGCCCCGATTAGAGCTTGAC  
GGGGAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG  
GTCACGCTGCGCGTAACCAACACACCCGCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTCGCCATTTCAGGCTGCG  
CAACTGTTGGGAAGGGCGATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGAT  
TAAGTTGGGTAACGCCAGGGTTTTCCAGTCACGACGTTGTAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTA  
TAGGGCGAATTGGGTACCGGGCCCCCCTCGAGTCTAGAAGTGGATCCCCGACGCCGAAGTGGAGCCGACAGCCCCC  
AGGTCCCAAGCCCTCGGCAGACTAGATCACTAGCCCTGGATCGGCGAGGTGACTGGATGACGAGCAGCACCTGGTCTGGC  
GGGTGTTGGGCGAGTAGAACCAGGGGCGATGGCGACGCGCTGACCTTCTCCCCCACCAGGCGATCTGCTCCTTCTGGGTG  
GGGGTCGCGGCTGACGTTCTGTTGCGGGGTGGGGGTGCGCGCTGCGGTTCTGCTGCGGGGTGGGAGTCCCGACCGGC  
GTGCTGCTGCTAGGACAATCGGTGAGGCCAGTTAGGTGCTAGCCGATCGATTGGCGAAGAGATCCGAGTCTGGGGAGAT  
CAGTGAGGCCAGGTGCTATTTGGCCTATCAATTGGCCAGGTTCTGGGAACGGGGCGTGGCGTGATCAACGAGGTGCTAGG  
CTGCTAGCTAGGGAAGTGGATCCTGGAACGTGGAGGAGGCAAGTCCGGTATGCTAAGTACTTTAACTTTCTTCTTCA  
TCCACCTGATTGAGATTATTTTGTATCTAAATTAAGTGGCAAAAATATATGTGTGATATCCATCTACTATAATTGCTTAC  
AATCAAAATTATATGTGATTTTTTTTAGTTTGAAGATTATATGCACAGTAAATCTGAATGTTCTTACATGCATGATT  
TAGTTTAACTTTAAAGAGTTATACTAACTAGTCTTGATAAAGAGATCTTTTGGAGCAACACCAACCTCGTGAGGTGTTT  
TGCCCTACGGAAGGTTGTGCTATGTAATGATTATTATTAGGATCAAAGTTGTAGGATAAACGTAAACCTTCTCGATGTA  
TCTTTTATACAACATTGTAGTTTAGTTATATATGGAGAGAGTGATTAACTTTGTGTTTAAAGAGTAGAATAAGTTATT  
CCACACTCTAGCCAAACGAACATTTTGGCAATATCTCGCTAGCTGGTGAGAGCCAGAGCCGTGGAAAGTCTGTCTTGCT  
ATTAAGGCACAAGCATCAAACAGGAACATTTAGAGCCATGGAAAAGTGATGTGTGCGCTACCAATGGGCCAACTGCTAGC  
GATGTAATAATAGCATCCAAGTTGATTTTTTATAGAACATGCAAGGCGTTGGCAAGTGGGAAATGATTGATCGCTGGCA  
AGCTTAACTCTCGGAACCTATAGCATTCAACTGAATCAGAACAAGATTAAAAAAAATACATTTCCATCGATAGTAAA  
AATTATTCAATTGAGTGACAACGAAATCATATTGGAATGTACATTTACTTGTGATTTTAAATTAGAGGCATTTTCTA  
CCTTTTTTAGTTAATAAGATATGCATATACCCACCCTTAGTGTTCGAGACAACGAGAGGGCACATTGCTTTTGGTGCT  
ACCATCTCTCTCAAGCCTCAAATAAGTTGTGCGGACAGGATTATCTTCCCGCGTTGGAATATCGTGCCCTGGTAGAGCTA  
GCGAAAAATCTTCCATGTTGGAATATGTGCGGACCGGATAGCCGCCATGCATGTAAAGTCTCTTTTACCTTTACACTTG  
CTCAAGTGACACTGTATGTGCGCTACCACTTGCTAAATCAATGGGCCAACTGCTAGCGACGTAATAGTAGCAAGTTGATT  
TACAGTGTTTTGCTACAGTTCTCTGACTTTGTTTCTTCATTTTAGACTAGCTGACTACTGTGCTTACCTGCCTTCCCTT  
CTCCACGTTAGAGGATCCAGTTCTGATATTGAGACCTCGACGATGGGAGGAAGGGCGCGATCGATGTGGAGTAATTTGAA  
TTTCAAACTATCTATCTGTTGTTATTTGGTCCCTTACCGATGTTTGGGGGGCTGTGCGAAATTGGTTCCGCGATCTACA  
AAAGTGAATGGAGGGAGTAGTTGTTTCTCCAATCCGTACCAACGCACGTGTTTCTAACTAGTACTTACTTCCCTCGCACC  
ACAATATGGAATAGAGGGAGTATCGATAAACTAACAAAGATGATTACTTACCCGGTTTAAATGATTCAAGAGCTCATTTA  
ATTTGGCACTCATCATTTATATATCTTTTTTGGTAGAAATGAAATAAAGCAGATCTAGACACTAGCTAAAAAGTCGATG  
TAGCCTTGTTATTTTCTTGGGCCACGCGGGCCGGGTGTGGTGCTCCCTGCTCTGTGTATAAATGGAGATCAACATCCAAG  
GCCTCCTCCACACACACGCTACAGAGCAGAGCAGAGTCTTGCTCCAGTATCTGCCCTCTCCTGCCTGCCTGTAGAGC  
ATCCATCACGTGAAGTTCACGGACAACTACGTACACAGGACGCTAGCTCTCGAAACCTCGCTCGAAACGCACCTGCAGA  
TCGCTCTCTTCGTGCTGCTGCGCGGATCATCATCAACAGCTCCGTCTGCCTTGGAGCCACGGCCGTCCACGACGCGGCC  
GCCTCAGGTGAGTGTGCGGACGGTGTCCGTTTCAATTTCTCCCTCCCATTTTTGTAATTGATTAACTTGTATACATGCTGAC  
TCGACCTGCTGAATAACGTCCGTCCATGGTTTTCCCGTCCAGGCACCCCGGGCTGCAGGAATTCACCACCACCACTCCA  
CCAGTAAGAAGTGCAGCAGGTAGCTAGTAAGCCGGCGTAGCTTTGCTCTTGACGCTAGCTAACCATGGCCGCTCT  
GCCTCTTGCTTTCTCTTGTGGTGCTCGTGGCTCTGGCCACGGCGGCGTGGCGCAGCTGTACCGACCTTCTACGACAC  
GTCTGCCCCAGGGCCCTGGCCATCATCAAGAGTGGCGTATGGCCGCGGTGAGCAGCGACCCCTCGGATGGGCGCGTCCG  
TGCTCCGGCTGCACTTCCACGACTGCTTCGTCCAAGGCTGCGACGCGTCTGTTTTGCTGTCTGGCATGGAACAAAATGCT  
ATCCCGAACGCGGGGTGCTGAGGGGCTTCGGCGTATCGACAGCATCAAGACGAGATCGAGGCCATCTGCAATCAGAC  
CGTCTCCTGCGCCGACATCCTCACCGTCCGCGCCCGTGACTCCGTTGTAGCCCTCGGAGGGCCGTATGGACAGTCCCTC  
TGGGGAGAAGAGATTCCACAGATGCAACGAGGCGGCGGCAACAGCGACCTGCCAGGCTTTACATCTAGCCGGTCAGAT  
CTTGAGCTGGCATTGAGAAACAAGGGCCTCCTTACGATCGACATGGTGGCCCTCTCGGGCGCGCACACCATCGGCCAGGC  
GCAGTGTGGGACCTTTAAGGACAGGATCTACAATGAGACTAACATCGACACGGCCTTCGCCACATCTCTCCGGGCCAACT



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GCCCCAGGTCAAACGGCGACGGGAGCCTGGCGAACCTGGACACGACGACGGCCAACACGTTTCGATAACGCCTACTACACC  
AACCTCATGTACAGAAGGGGCTCCTGCACTCGGACCAGGTGCTGTTCAACAACGACACCACCGACAACACTGTCCGGAA  
CTTTGCGTCGAACCCAGCGGCTTCAGCAGCGCCTTCACGACCGCCATGATCAAGATGGGCAACATCGCGCCGAAGACAG  
GCACGCAGGGGCGAGATCAGGCTCAGCTGCTCCAGGGTGAACCTCGTGATTGATAGACGAGTTACTGCATACTAGCCAGCAC  
GACACGTACGTGAATGAATAAGGCCACAGAACCAGTGGCCAATATAAATACCAGCTCTTGAAACCGTGATTTTATGTAC  
GAGTAGCAGCAAATCATGCATGCATCTACACATATATATGTAACGATCGAATTTCCACTTTCTCATGCAAAGGCATGGAG  
AATTACTATCAATCTTAGTTATACGTGTATAAAAAGCGGCGCGAATTCGATATCAAGCTTATCGATACCGTCGACCTCG  
ACCTGCAGGCATGCCCGCTGAAATCACCAGTCTCTCTCTACAAATCTATCTCTCTCTATAATAATGTGTGAGTAGTCCC  
AGATAAGGGAATTAGGGTTCTTATAGGGTTTCGCTCATGTGTTGAGCATATAAGAAACCCTTAGTATGTATTTGTATTTG  
TAAAATACTTCTATCAATAAAATTTCTAATTCCTAAAACCAAATCCAGGGGTACCGAGCTCGAATTCAGTCTACGCGG  
CCGCGAGCTCCAGCTTTTGTTCCTTTAGTGAGGGTTAATTGCGCGCTTGGCGTAATCATGGTCATAGCTGTTTCCTGTG  
TGAAATTGTTATCCGCTCACAATTCACACAACATACGAGCCGGAAGCATAAAGTGTAAGCCTGGGGTGCCTAATGAGT  
GAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCAGTCCGGAAACCTGTCGTGCCAGCTGCATTAATGAA  
TCGGCCAACGCGCGGGGAGAGGGGTTTGCCTATTGGGCGCTCTTCCGCTTCTCGCTCACTGACTCGCTGCGCTCGGTC  
GTTCCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAA  
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCC  
CCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTT  
CCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCTGCGGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGG  
AAGCGTGGCGCTTTCTCATAGCTCAGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTTCCGCTCCAAGCTGGGCTGTGTGC  
ACGAACCCCCGTTTCAGCCCGACCGCTGCGCCTTATCCGTAACCTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTA  
TCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTG  
GCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTG  
GTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCAAGCAGCAGATTACGCGCAGAAAA  
AAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACCTCACGTTAAGGGATTTT  
GGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAATAAATGAAGTTTAAATCAATCTAAAGTATAT  
ATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCC  
ATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACC  
GCGAGACCCACGCTCACC GGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTG  
CAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGC  
AACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTACGCTCCGGTTCCCAACG  
ATCAAGGCGAGTTACATGATCCCCATGTTGTGCAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA  
AGTTGGCCGAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTT  
TCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAAT  
ACGGGATAATACCGCGCCACATAGCAGAACTTTAAAGTGCTCATCATTTGGAAAACGTTCTTCGGGGCGAAAACCTCTCAA  
GGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTTACC  
AGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACT  
CATACTCTTCTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTT  
AGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC

continuation Figure 5a

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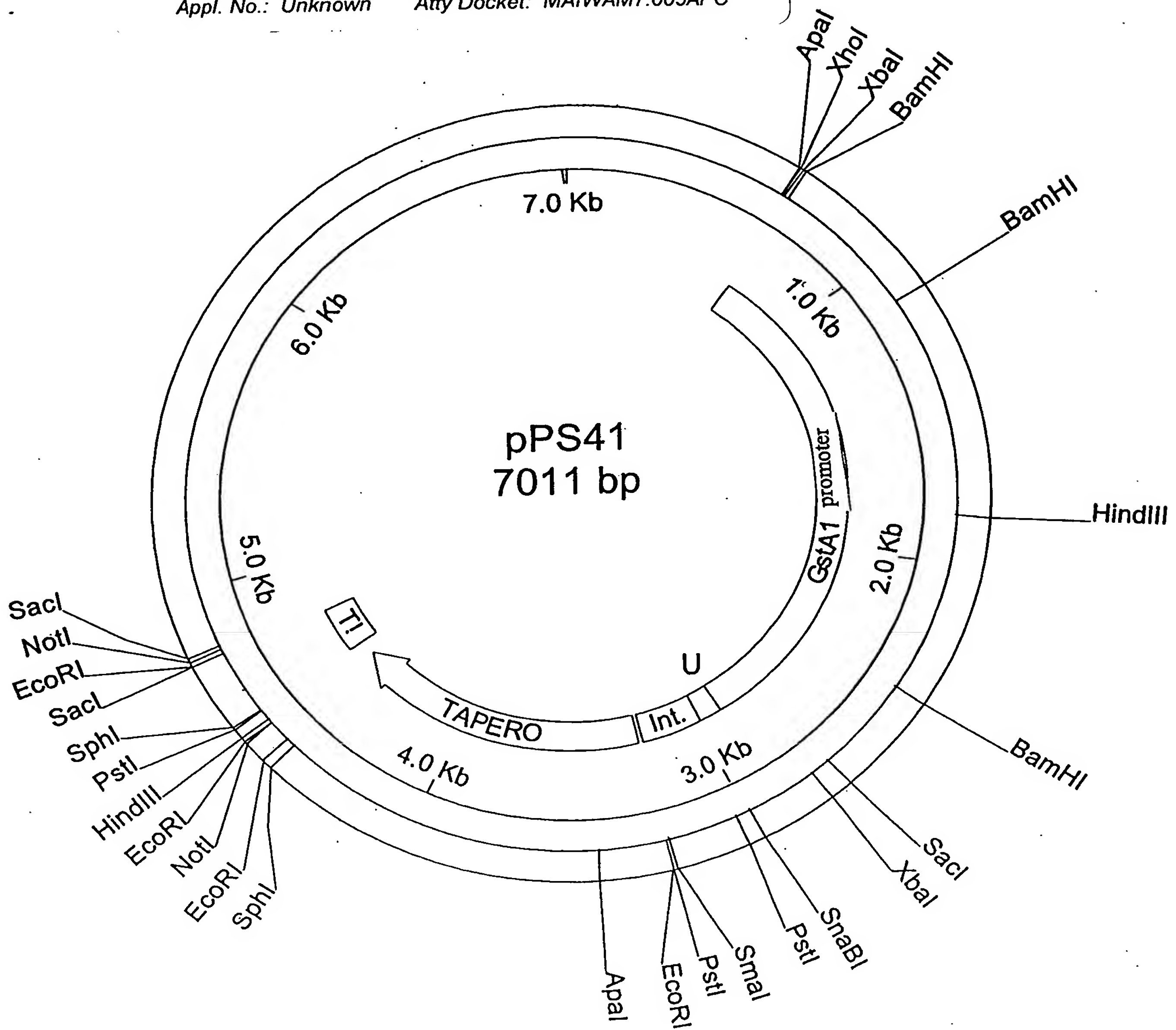


Figure 5b

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
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Figure 6

Germin 9f-2.8:

AGCTTATTACATAGCAAGCATGGGGTACTCCAAAACCCCTAGTAGCTGGCCTGTTCGCAATGCTGTTACTAGCTCCGGCCG  
TCTTGGCCACCGACCCAGACCCTCTCCAGGACTTCTGTGTCGCCGACCTCGACGGCAAGGCGGTCTCGGTGAACGGGCAC  
ACGTGCAAGCCCATGTCGGAGGCCGGCGACGACTTCCTCTTCTCGTCCAAGTTGGCCAAGGCCGGCAACACGTCCACCCC  
GAACGGCTCCGCCGTGACGGAGCTCGACGTGGCCGAGTGGCCCCGGTACCAACACGCTGGGTGTGTCCATGAACCGCGTGG  
ACTTTGCTCCCGGAGGCACCAACCCACCACACATCCACCCGCGTGCCACCGAGATCGGCATCGTGATGAAAGGTGAGCTT  
CTCGTGGAATCCTTGGCAGCCTCGACTCCGGGAACAAGCTCTACTCGAGGGTGGTGC GCGCCGGAGAGACGTTCTCAT  
CCCACGGGGCCTCATGCACTTCCAGTTCAACGTCGGTAAGACCGAGGCCTCCATGGTCGTCTCCTTCAACAGCCAGAACC  
CCGGCATTGTCTTCGTGCCCCCTCACGCTCTTCGGCTCCAACCCGCCCATCCAACGCGGTGCTCACCAAGGCACTCCGG  
GTGGAGGCCAGGGTCGTGGAACCTTCTCAAGTCCAAGTTTGCCGCTGGGTTTTAATTTCTAGGAGCCTTCCCTGAAATGAT  
AATTATATAATTCCATATATGCATGC



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Figure 7a

characteristics of pPS24:

total length	6452 bp
vector Backbone: pBluescript SK+,	entire construct between XhoI and SacI restriction sites
GstA1 promoter	694-2891
Transcription start:	2892
GstA1 5' UTR	2892-2988
WIR1 5' UTR (part)	2989-3034
WIR1 part of 5' CDS + Intron	3035-3246
Germin 9f-2.8 Gen	3258-4003
ATG Germin	3277
Stop codon:	3949
CamV 35S Terminator:	4017-4210

Sequenz:

CTAAATTGTAAGCGTTAATATTTTGTAAATTCGCGTTAAATTTTGTAAATCAGCTCATTTTTTAACCAATAGGCCG  
AAATCGGCAAAATCCCTTATAAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTGTTCCAGTTTGGAAACAAGAGTCCA  
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACC  
CTAATCAAGTTTTTTGGGGTTCGAGGTGCCGTAAAGCACTAAATCGGAACCTAAAGGGAGCCCCGATTTAGAGCTTGAC  
GGGGAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG  
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTGCGCATTCAGGCTGCG  
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TGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCAGTCGGGAAACCTGTCTGCGCCAGCTGCATTAATGA  
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TAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC

continuation figure 7a

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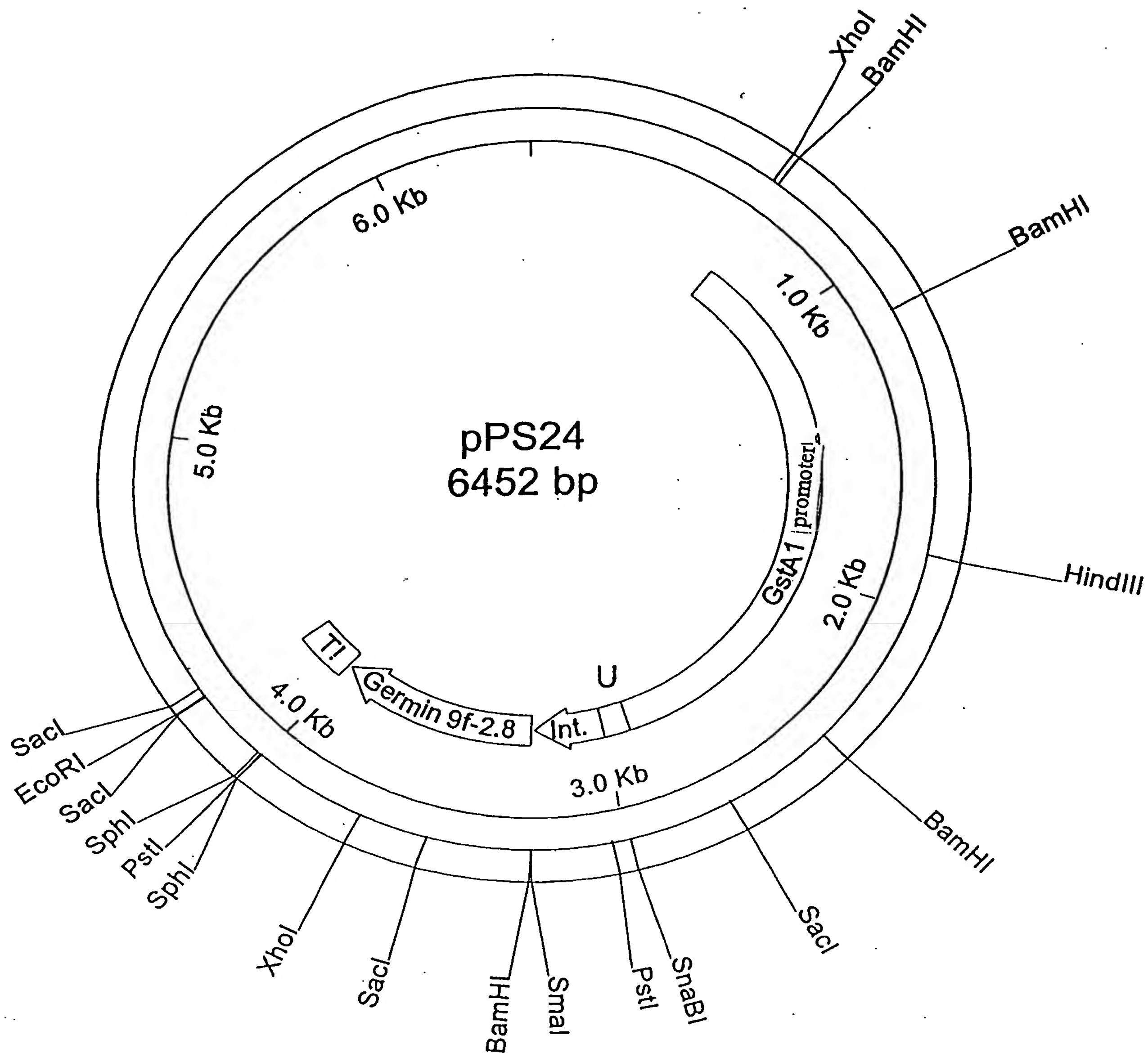


Figure 7b

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
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Figure 8.

TaMlo inverted repeats and MlaI Intron:

CCACTGTCCACACGAAATGTGCCATCTGAAACGCGTTCTGGAACAGCGTCAGGTGTATGAAGAAGAGGACCCAGTCGGGG  
CGGTGGAACCAGAAGAACTTGTTGCTGGGCTCGACCACGGGTGCCCCCTTGATGACGCTCGACCGGTCTGGATCTCCAG  
GGCCATCTCCATGATGATCATCTCTAGCTTGGTTCCAACACACAAGAGGATGATGAGAGGGATGAAAGAAACCCAGGTGA  
GTGTGCCGATCCCGTCGATATCAAGGAAGAGGGTGAGGATCGCCACAGCCACAGCGGGAGGCTGCCAAAAGAGGCCAAA  
TGTGTCAAGATCATGCAACAAGGACCAGCAGGGGCAAAGACCATGACGCAGCAAACCTGATAGTATTGTATCATATGGAAG  
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AATTTAGAAAAAGTACACTATTATGTGATGTTTGTTCCTATGCTAGTGGAACGGATTAGAATTTTTTTTTCATTAAGG  
TCACCTTTACTGGCATAAGCAGTTCACACTAAACGGTAAACCTTATAGGTGAAAATTTTCAGGCATATATATATATATAT  
ATATATATATATGTTTGATTCTTTCGGGCTTAACAAAATAATTAGCAAGTACTTCTTGTTGCATTTGTTCCAACGGCTGA  
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AATAAACCAAAGGAGAGGAAGGAAGAGGAAGATAAATGTTACAAAATTTAAATCAAACCTTATTTCTACCTTTCTCCT  
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TGGACAGGCATGCGACTGG



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Figure 9a

characteristics of pWIR5-TaM1o-RNAi:

total length	7633 bp
vector Backbone: pBluescript SK+, entire construct between XhoI and SacI restriction sites	
GstA1 promoter	694-2891
Transcription start:	2892
GstA1 5' UTR	2892-2988
WIR1 5' UTR (part)	2989-3034
WIR1 part of 5' CDS + Intron	3035-3246
TaM1o IR1	3252-3556
Intron M1a1	3698-4731
TaM1o IR2	4877-5190
CamV 35S Terminator:	5191-5391

Sequenz:

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TAAGTTGGGTAACGCCAGGGTTTTCCAGTCACGACGTTGTAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTA  
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ATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAG  
GGGTTCCGCGCACATTTCCCCGAAAGTGCCAC

continuation figure 9a

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

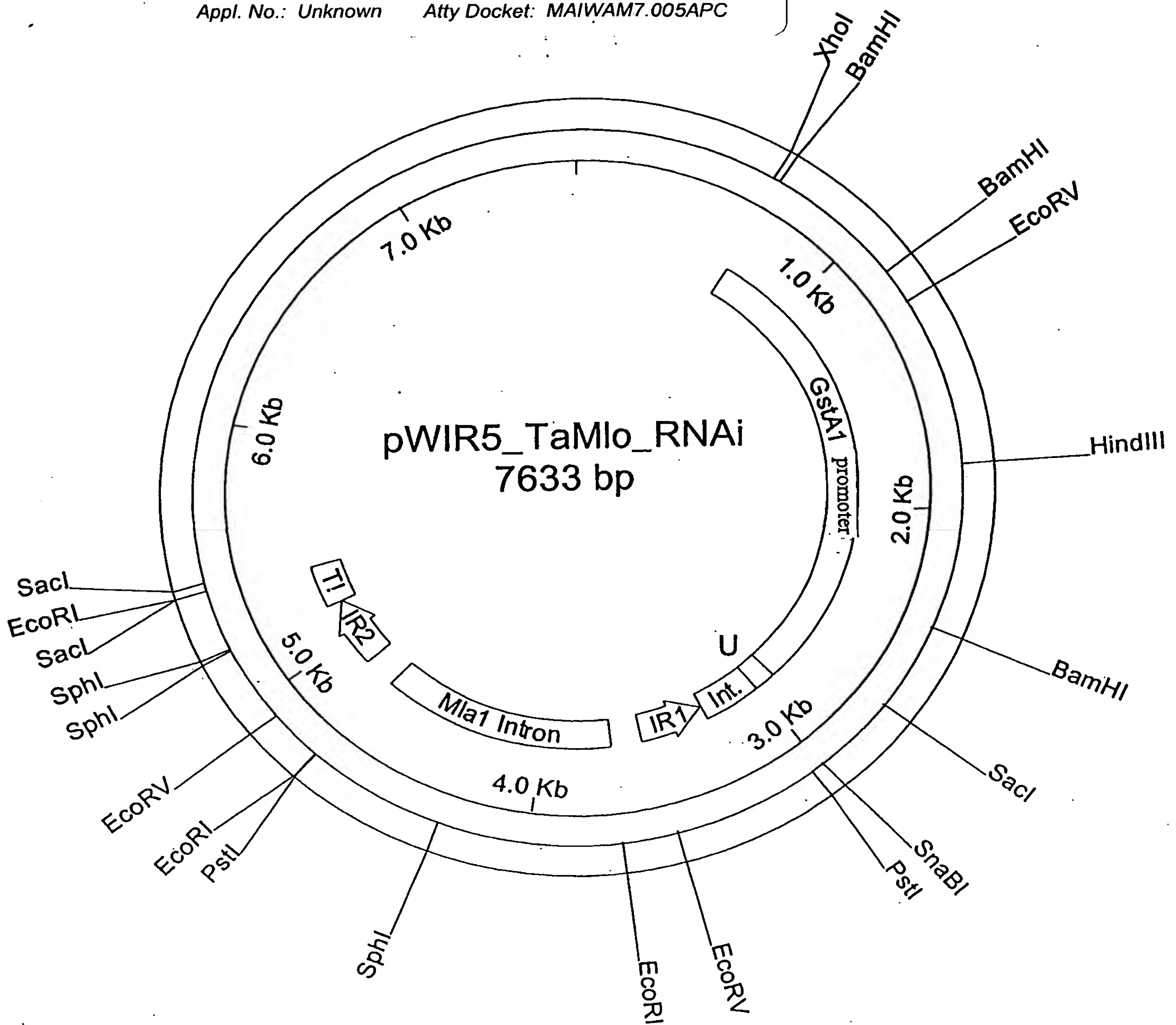


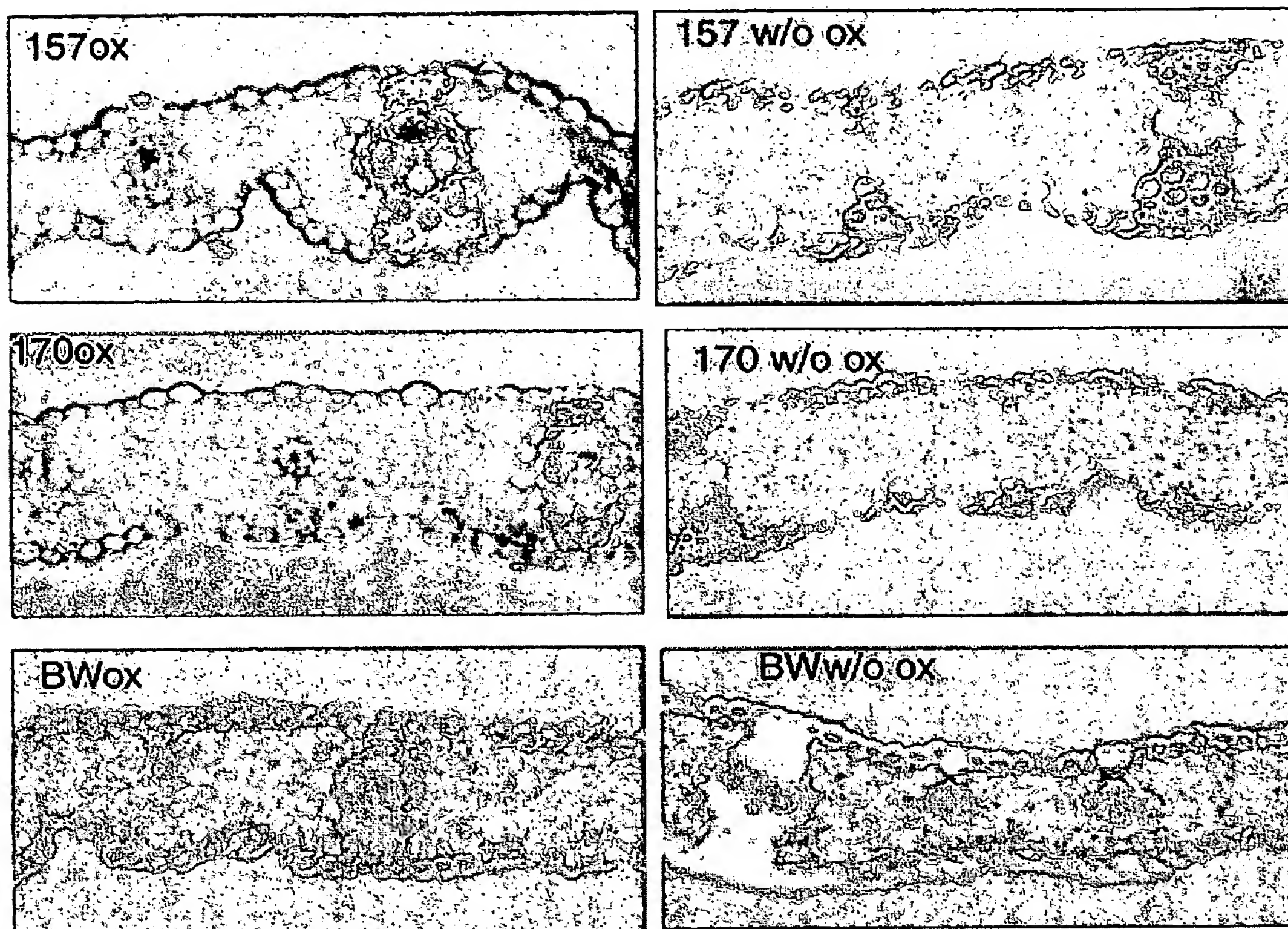
Figure 9b

PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.

Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

Figure 10:





PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

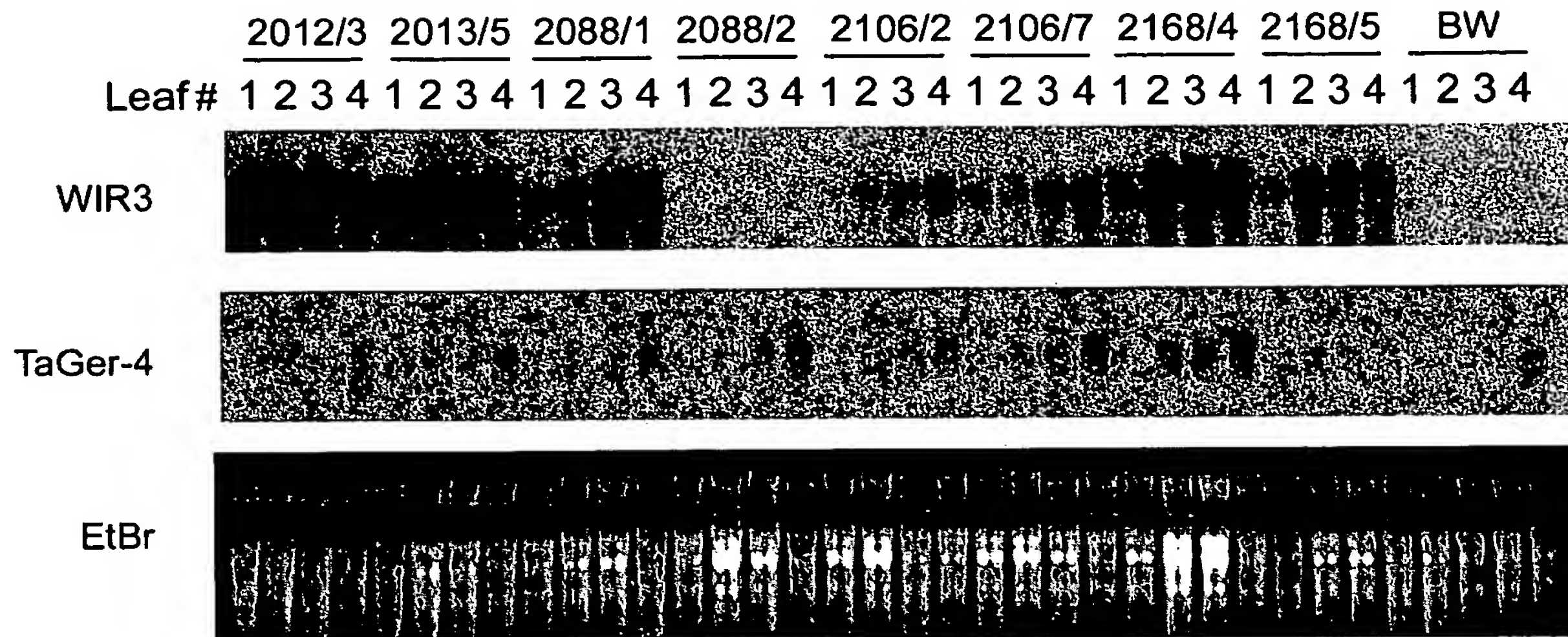
Schweizer et al.

Appl. No.: Unknown

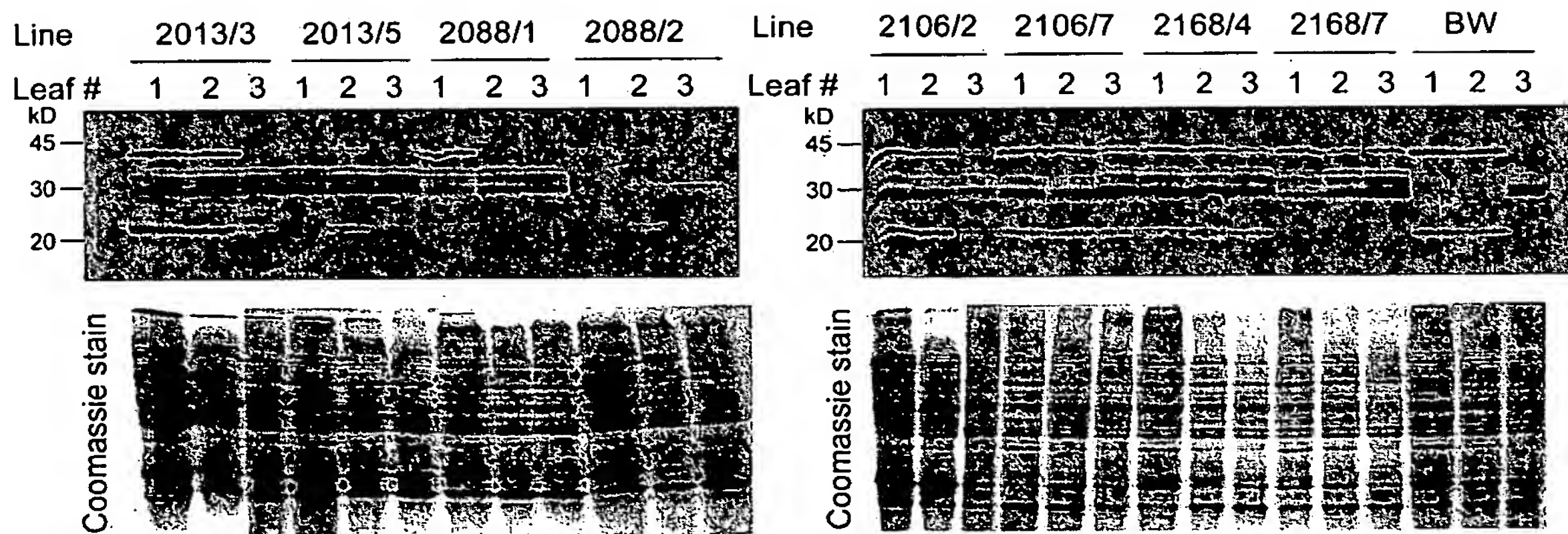
Atty Docket: MAIWAM7.005APC

Figure 11:

a)



b)



PROMOTER FOR THE EPIDERMIS-SPECIFIC TRANSGENIC  
EXPRESSION IN PLANTS

Schweizer et al.  
Appl. No.: Unknown Atty Docket: MAIWAM7.005APC

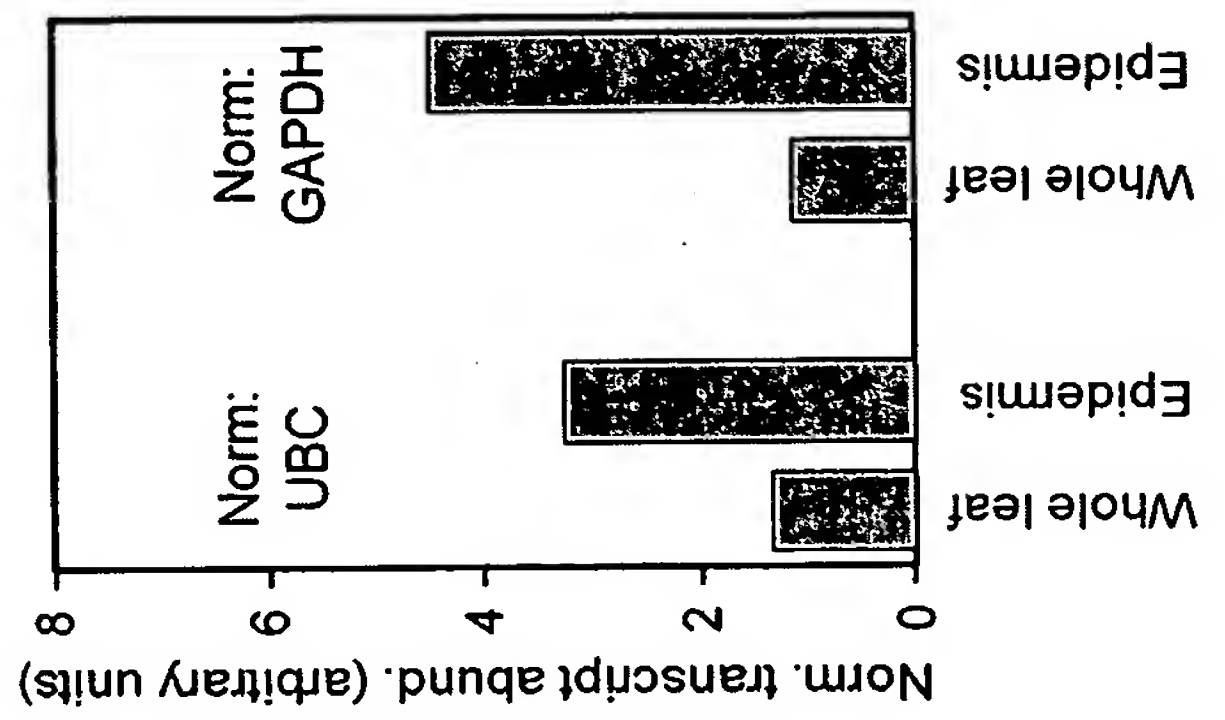
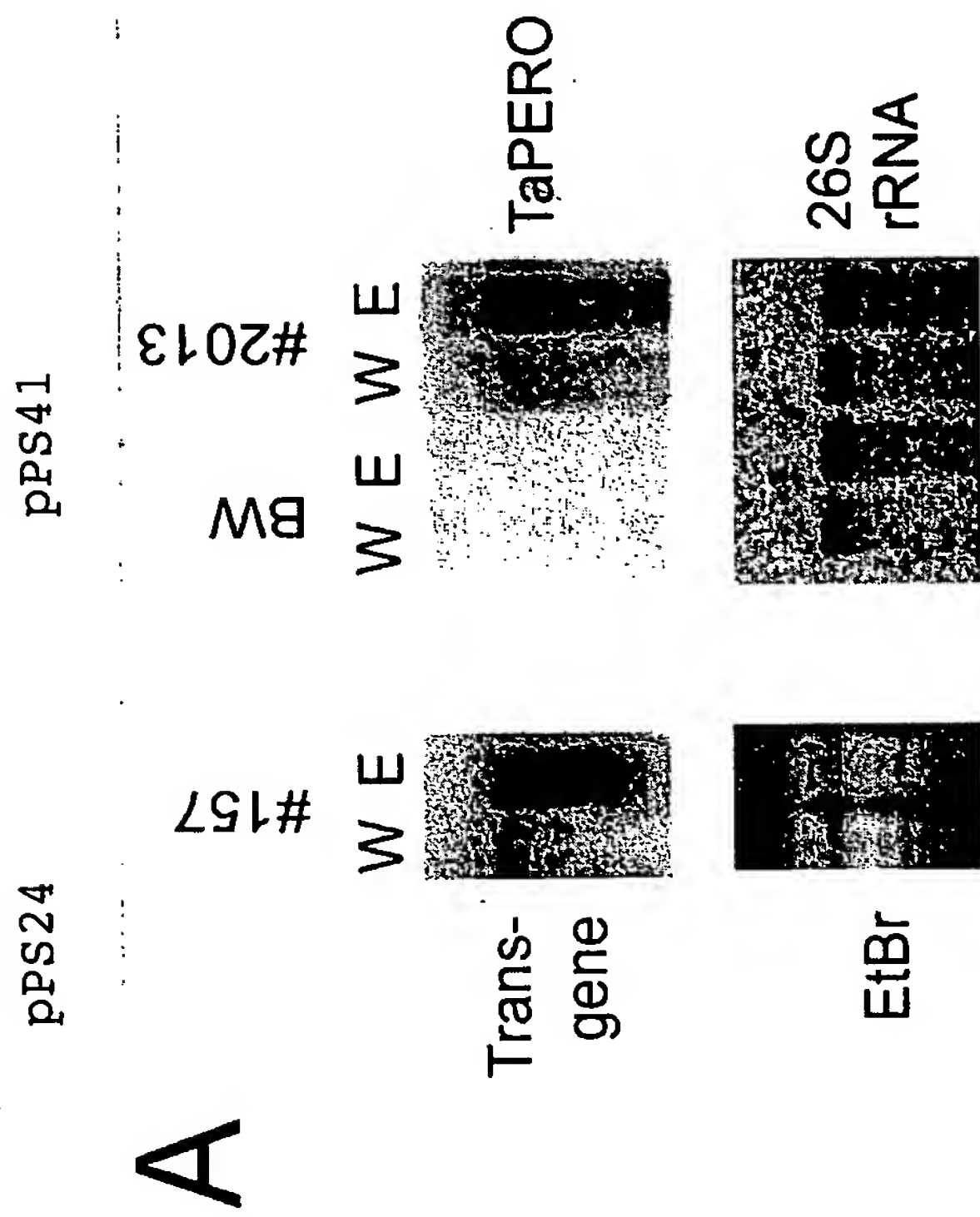




Figure 12  
C

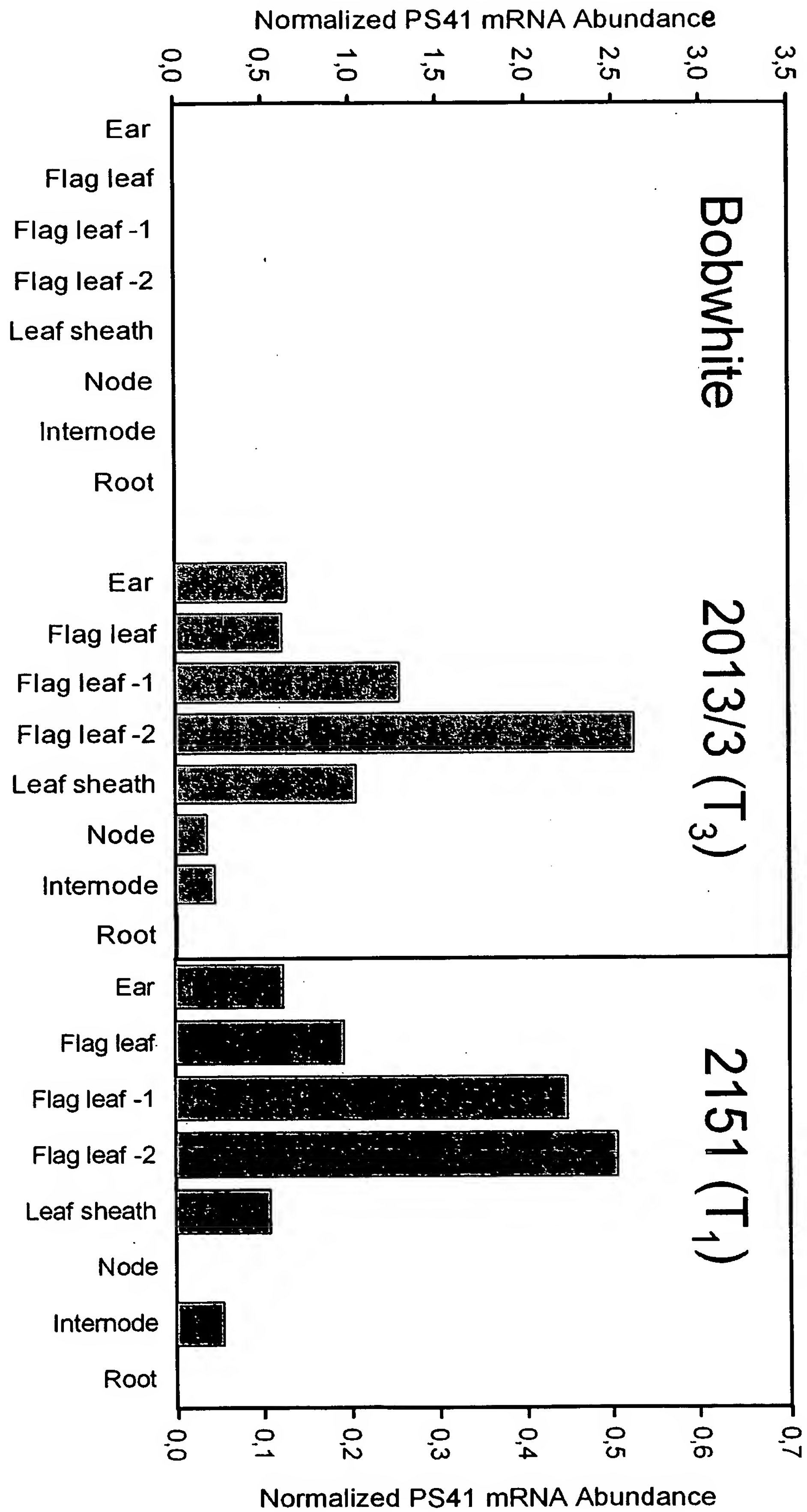
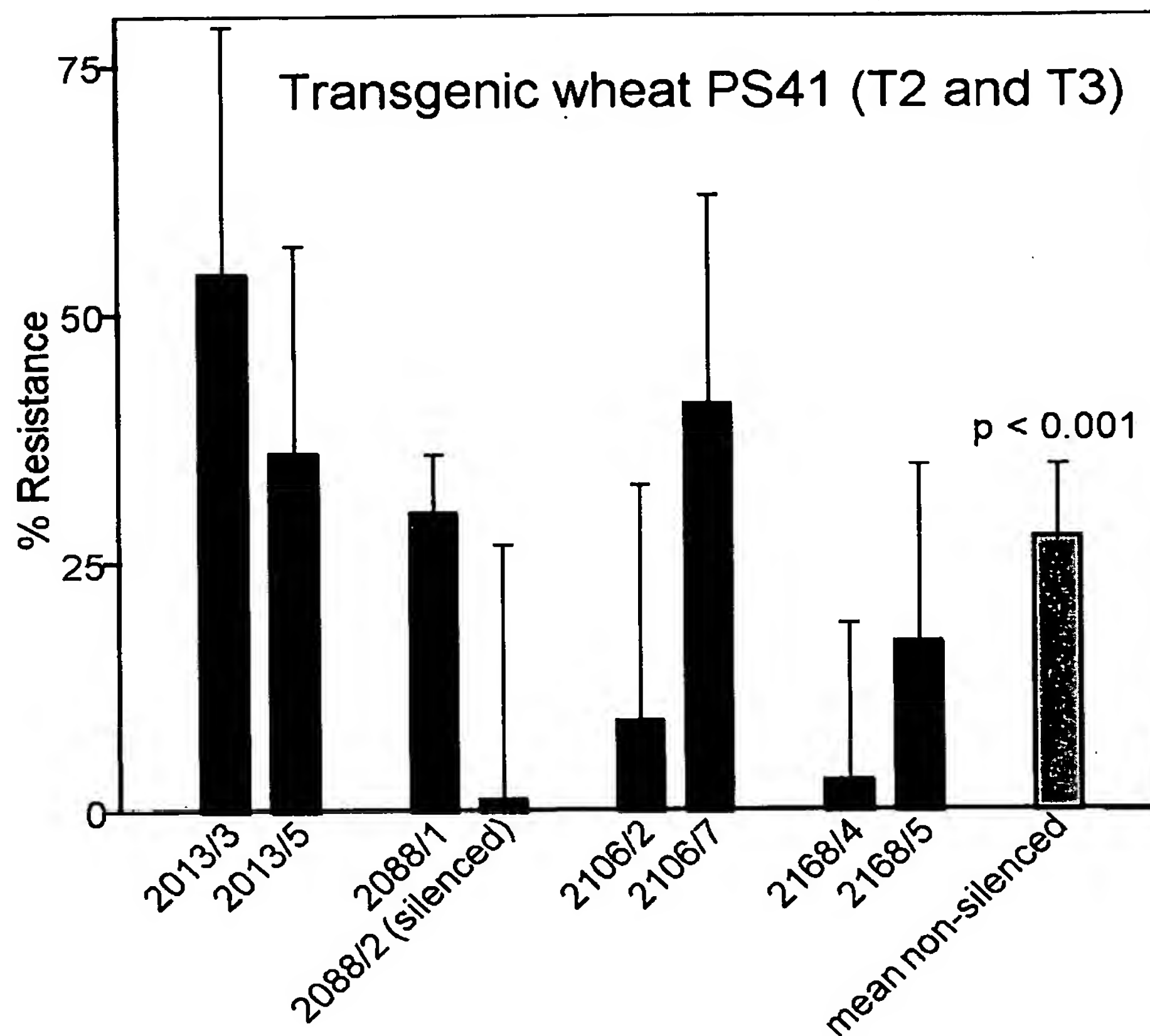


Figure 13:

Mildew resistance of transgenic wheat lines that carry the pPS41 construct.



The flag leaf of adult plants was cut away and inoculated with wheat mildew in a detached leaf assay together with Bobwhite wild-type plants. 7 days after inoculation, the mildew infection was evaluated. Mean values from 3 independent inoculation experiments with plants of the T2 and T3 generation are shown. Subline 2088/2 does not express TAPERO and is not increased resistant. Mean non-silenced = mean value of all lines except 2088/2 and all experiments.

Figure 14:

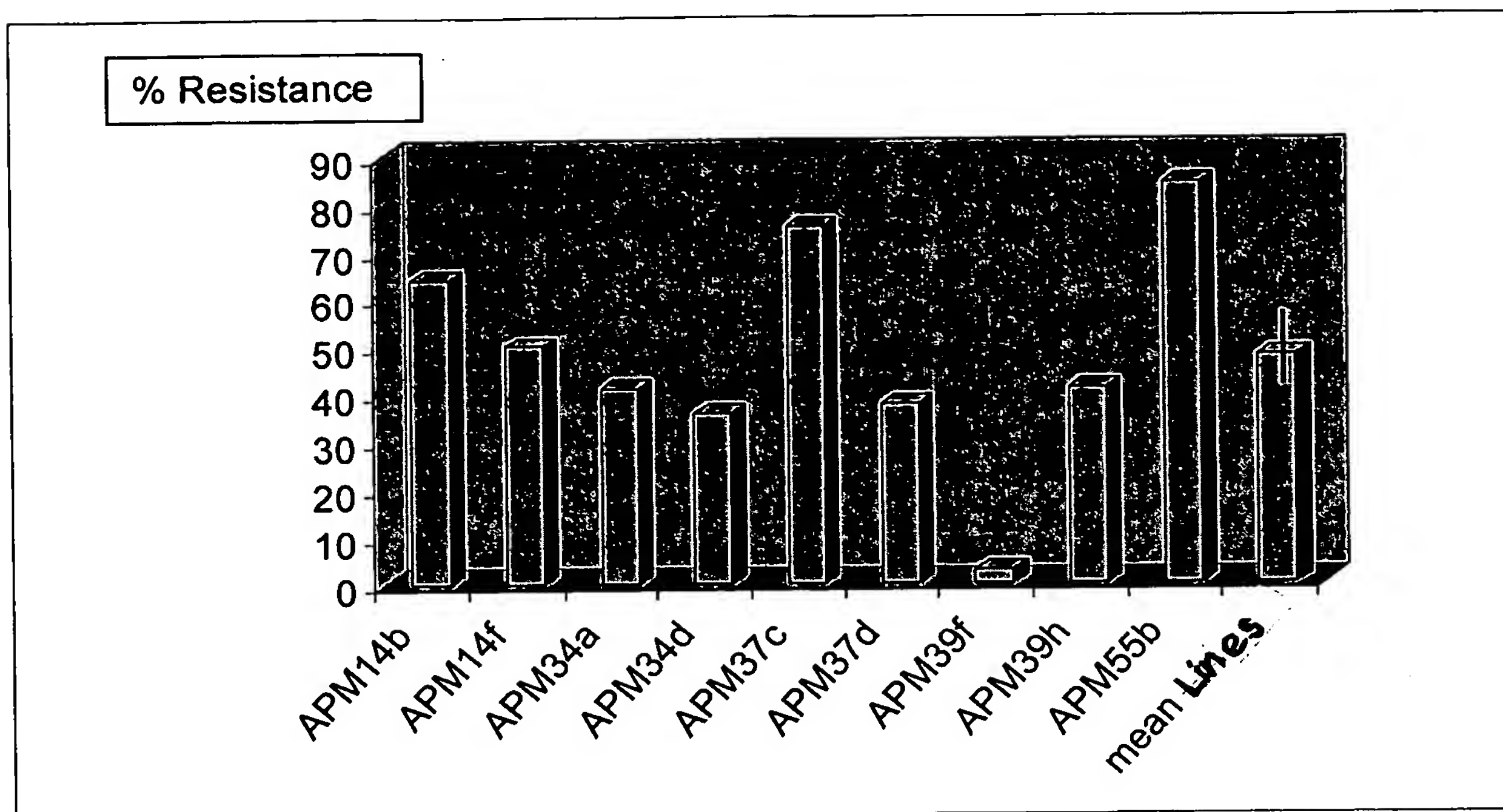
Normal growth-phenotype of transgenic plants carrying the pPS41 construct.



Plants of the T2 generation were sown together with Bobwhite wild-type plants and photographed in the adult plant stage.

Figure 15:

Mildew resistance of transgenic wheat lines carrying the pWIR5-TaMlo-RNAi construct.



The flag leaf of adult plants of the T2 generation was cut away and inoculated with wheat mildew in a detached leaf assay together with Bobwhite wild-type plants. 7 days after inoculation, the mildew infection was evaluated. 2 sublines per line were tested in each case.

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